intent of their own system and the ILEC system. The proportion of time spent in testing must therefore be increased.

Some CLECs are not willing to gamble on electronic interfaces that are put in place in a short period of time. For instance, Mr. Rogers states that USN has decided to use manual procedures to work with Ameritech on ordering, provisioning and repair. While these CLECs appear to have made the decision to enter the market with a systems strategy that reduces the risks of interface problems and lowers their systems investment levels, that approach is not always adequate. First, manual processing is inconsistent with the FCC Order. More importantly, manual processes are wholly inadequate to support competitive LEC entry on any significant scale. AT&T's broad-based attitude toward entering the market needs comprehensive computer-based support. As a consequence, a thorough testing regimen is essential.

Q. ONCE THE CLEC SYSTEMS ARE IMPLEMENTED AND PROVEN TO WORK WITH THE ILEC SYSTEMS, IS THE EVALUATION AND ANALYSIS OF THE SYSTEMS COMPLETE?

A. No. The ILEC and CLEC operations support systems must operate in ways that support on-going competition. Thus, the parties must be able to monitor how the systems are working with each other through the interfaces. A series of reporting

mechanisms are needed to ensure that the ILEC systems are available according to reasonable operating schedules; that the ILEC systems provide timely and accurate information regarding the local service offerings, including unbundled network elements; and that the ILEC systems are processing CLEC transactions effectively. Most importantly, the reporting mechanisms should reveal actual experiences on a real-time basis so that corrections can be made before negative results degrade the competitive market environment.

Q. HAVE AMERITECH'S OPERATIONS SUPPORT SYSTEMS REACHED AN ACCEPTABLE STATE OF READINESS?

A. No. The Ameritech/AT&T OSS development project is enormous in scope and size. To complete a project of this size, the parties should be working together in a very cooperative and closely linked fashion. Specifications continuously change, making it absolutely essential that the parties communicate to ensure that an efficient system design evolves. However, for reasons which appear to be related to Ameritech's present position in the local services market, this type of close cooperation has not occurred. As discussed elsewhere in this testimony, the lack of cooperation and the unwillingness to share information has caused problems and delays.

Attached as Exhibit TMC-02 is a matrix of the status of AT&T's development of electronic OSSs with Ameritech. The exhibit reflects the status of each of the

needed interfaces. As this exhibit illustrates, none of the needed systems are currently in a state of operational readiness and only certain interfaces have begun to be tested on an integrated basis.

Significantly, discussions to date between AT&T and Ameritech have centered largely around the interfaces to be used for resale services. The discussions related to the purchase of unbundled network elements, and more importantly, combinations of unbundled network elements (the platform) have been only extremely preliminary in nature. In large part this is because AT&T and Ameritech cannot agree on how the platform will be provisioned operationally. That disagreement makes it very difficult to have meaningful discussions about how the ordering interfaces should be designed. Moreover, because there are no UNE tariffs or any AT&T/Ameritech interconnection agreements, AT&T is not yet in a position to order unbundled network elements.

Q. IS EITHER PARTY TO BLAME FOR THE LACK OF OPERATIONAL READINESS IN THE INTERFACES?

A. The purpose of this examination is to critically assess the currently available interfaces and support systems. It therefore does little good to engage in "fault-finding." The central issue in this proceeding is to determine whether local service choices are actually available to end users. Regardless of where "fault"

may or may not lie, Ameritech must show that CLECs have non-discriminatory access to all necessary support systems and interfaces.

Q. BUT IF AT&T IS HAVING SYSTEM PROBLEMS, WHY SHOULD AMERITECH BE BLAMED?

A. The ILEC and CLEC systems are necessarily complementary. The interfaces and systems should therefore be developed together and, to the extent practicable, should be designed to meet a total capacity. The systems should also be tested together. Ameritech should be eager to bring AT&T and other CLECs in at the earliest stages of development and should want to work as a "team" to share information. Systems problems should be considered mutual problems that both sides of the interface should work together to resolve. A "find someone to blame" approach is not likely to lead to systems that are effective or operational. Moreover, the "blame" approach tends to overlook the fact that the systems do not work as well as they must, and certainly are not working at the required "parity" level.

Unfortunately, my review of Ameritech's testimony suggests that Ameritech is more interested in finding fault than it is in resolving the problems that exist or in ensuring that the systems are operational.

Q. CAN YOU PROVIDE EXAMPLES?

A. Yes, I can. Much of Mr. Rogers' testimony is devoted to explaining that the number of AT&T orders rejected using the electronic ordering systems in current testing was due to errors on AT&T's side of the interface. This is beside the point. The point is that, to date, only a small number of orders have passed through the Ameritech interfaces and most of those did not pass through the system without errors. In 2 1/2 months of testing in Illinois (from October 6 to December 20), only a total of 211[2] AT&T orders have been processed by Ameritech. Of those 211, only 79 were completed. One half of these orders were rejected. The results of testing as of December 20, 1996 are as follows:

Order Transactions Processed	211	**Percentage**
Orders Rejected	109	51%
Orders Completed	79	38%
Orders Pending	23	11%
Orders Processed Manually	105	50%
Rejected	28	27%
Completed	55	52%
Pending	22	21%
Orders Processed Automatically	106	50%
Rejected	81	76%
Completed	24	23%
Pending	1	1%

[2] This information used to report testing results in the testimony was taken from Ameritech testing reports. The actual number of "transactions" processed and the status of any single transaction at any particular time can be recorded in a variety of ways. Nonetheless, for purposes of consistency and convenience, I have adopted Ameritech's methodology for reporting testing results, and its results, in this testimony.

These results demonstrate that the systems are far from being operationally ready. The Service Readiness Testing Results are attached as Exhibit TMC-03.

Even Ameritech's exhibits demonstrate the systems deficiencies. In Mr. Rogers' Schedule 1, he identifies the number of orders processed through November 26. According to that document, of the 67 orders processed during that time period, 47 (or 68%) required manual intervention by Ameritech--that is, they were not processed relying exclusively on electronic interfaces.

Order Transactions Processed	157	**Percentage**
Orders Rejected	90	57%
Orders Processed	67	43%
Orders Processed Manually	69	44%
Rejected	22	32%
Processed	47	68%
Orders Processed Automatically	88	56%
Rejected	68	77%
Completed	20	23%

My understanding is that AT&T personnel involved in testing have asked repeatedly for explanations of what gives rise to the requirement for manual processes. Ameritech has not provided sufficient information (i.e., the Ameritech business rules) to reduce this manual intervention on a systematic basis.

Obviously, that information would be freely shared if a "team" concept were at work here.

In fact, there has been no significant improvement throughout the testing process. The Service Readiness Test Results Exhibit TMC-03, from November 7, 1996 show that the processing of orders has been consistently error-prone and manually intensive:

Order Transactions Processed	109	**Percentage**
Orders Rejected	63	58%
Orders Completed	37	34%
Orders Pending	9	8%
Orders Processed Manually	55	50%
Rejected	20	36%
Completed	28	51%
Pending	7	13%
Orders Processed Automatically	54	50%
Rejected	43	80%
Completed	10	18%
Pending	1	2%

In sum, the systems in question are very complex: Unless there is a true commitment to work together instead of finding fault, there will be delays in making services available, the quality of competitive services will slip and local competition may in fact be prevented. It does not appear from their testimony that

Ameritech has made that commitment with AT&T. If better results were experienced, it is reasonable that AT&T would have extended the testing process to validate additional types or volumes of PIC orders to increase the confidence it needs in trying to enter the local services market. It is unknown if other CLECs have received sufficient assistance from Ameritech, increasing their ability to interact with Ameritech's systems and interfaces.

Moreover, even if all 211 orders had been processed flawlessly -- which did not happen -- this number stands in stark contrast to the total number of orders which could be processed by IXCs should Ameritech be granted interLATA authority.

Q. EARLIER YOU INDICATED AMERITECH HAS BEEN DIFFICULT TO WORK WITH IN DEVELOPING THE OSS INTERFACES. PLEASE PROVIDE EXAMPLES.

A. The problems that arose with the handling of 860 transactions (discussed above) is a good example. As Mr. Pfau discusses in his rebuttal testimony, most other RBOCs have been willing to accept modifications of the entire order and program their systems to handle the full order being changed (consistent with AT&T's approach). Ameritech refused, initially, to even discuss this arrangement, citing only the lack of firm national standards which require this solution. This, in turn, delayed AT&T's design efforts. AT&T faces the option of either using a manual

work-around to this problem, which will be entirely unacceptable for anything but minimal volume levels, or delaying its entry into the local market.

Q. WOULD YOU PROVIDE ANOTHER EXAMPLE?

A. Yes. Another good example occurred early in the resale ordering specification design process. AT&T had already designed its systems around version 6.0 of the EDI standard, the version being used by other RBOCs. Ameritech, however, opted to design its systems around version 5.0 and refuses to this day to use version 6.0 -- even though most of the other RBOCs have designed around this version of the specification. Thus, AT&T has been required to develop additional system features to translate Ameritech's resale ordering transactions to the earlier EDI 5.0 standards.

THE CURRENT STATUS OF SYSTEM TESTING

Q. **HAS AT&T BEGUN TO TEST THE OPERATIONS SUPPORT SYSTEMS WITH AMERITECH?**

A. To date, testing has been limited to the AT&T/Ameritech ordering interface for resale. (See Exhibit TMC-02). The results of the testing have led to changes to both companies procedures and have necessitated further refinement of the specifications prepared by Ameritech. AT&T has received bills for resold services from Ameritech and is determining the accuracy of them in concert with

its Service Readiness Testing. AT&T and Ameritech have not conducted integration tests on the other resale interfaces (pre-ordering, and maintenance and repair).

As to the interfaces for the provisioning of unbundled network elements, the operational support systems necessary to support the platform or purchase of unbundled network elements are neither under development nor being tested. Although some of the specifications used in the resale arena may be used to support the resale of unbundled network elements, actual electronic interfaces need to be designed, developed and tested consistent with those specifications before being deemed operational. Because AT&T cannot at present purchase UNE through either a tariff or interconnection agreement, no testing is currently underway.

Q. WHAT OTHER SIGNIFICANT FINDINGS HAVE RESULTED FROM THE ORDERING TEST FOR RESALE?

A. As noted above, many of the orders are not being processed electronically, but are "falling out" to manual processes. Of the 211 test orders processed as of December 20, 50% have been processed using manual procedures by Ameritech. This is troublesome and unacceptable as the basis for actual market entry. Experience shows that manual processes are incapable of handling large volumes of transactions and are likely to stress Ameritech's ability to deliver timely and

efficient services. Manual procedures may also yield inconsistent results, increase the likelihood for delays in processing and create errors that would otherwise be avoidable. It is difficult to assess the full impact or magnitude of this problem as Ameritech has been reticent to provide AT&T with a list of the support activities which are being done on a manual basis.

Q. HAS AMERITECH SUFFICIENTLY TESTED ITS SYSTEMS?

A. No. Ameritech has tested its systems with its vendors -- Telesphere, IBM and GE Information Services. However, it is insufficient to rely on vendor testing to claim that an interface is operationally ready. Testing with a vendor is a necessary and important step in the process, but it is not a substitute for testing the transfer and receipt of electronic information with other providers, like AT&T. To do so is analogous to an airline company installing a newly designed "vendor tested" engine into a plane and flying passengers prior to flight testing the engine in the plane. Proper testing is critical: following interLATA relief, Ameritech will have no incentive to worry about whether the plane will ever leave the ground.

Q. AMERITECH'S WITNESS ROGERS ADDRESSES THE SERVICE READINESS TESTING THAT HAS BEEN IN PROCESS BETWEEN AT&T AND AMERITECH. DO YOU HAVE ANY COMMENTS?

A. Yes. Mr. Rogers provides some statistics that are accurate descriptions of the early results. The later results, available as of December 20, 1996, further demonstrate the poor showing of the testing. Consistent with the earlier results, 55 of the 79 completed orders (70%) being sent over the electronic interface by AT&T "fell out" to Ameritech's manual process and 51% of the electronic orders were rejected by Ameritech's systems due to errors in content. In total, only 38% of the orders that AT&T provided to Ameritech since the testing began on October 6, 1996 have been completed. The remaining 11% of the orders are still pending completion because of the order due dates. Any CLEC that wants to interact with Ameritech to place electronic orders should expect similar results.

I have attached to my testimony a copy of the Ameritech/AT&T Significant Events/Open Issues Tracking document, dated December 20, 1996 (Exhibit TMC-04). This document, which was prepared by Ameritech and is shared on a periodic basis with AT&T, serves as the basis for assignments of investigations as to the cause of errors and corrections to procedures. A "significant event" arises when conditions that give rise to the cause of processing problems are unknown and require research, either by Ameritech or by AT&T, or where certain activities are yet to be completed that will change the ways the transactions will be processed. This reports shows that there have been 38 "significant events" since October 10 (the earliest date of an "event" being recorded).

This report points out the need for additional investment in time and personnel to perform the necessary testing and to manage the process of researching problems, finding solutions and changing procedures in field operations. As a result, a CLEC must either invest in integration testing or expect serious customer-impacting system problems.

Q. MR. ROGERS ALSO DISCUSSES AT&T "FORCED" ERRORS AND SOME OTHER RELATED POINTS. WOULD YOU COMMENT?

A. In order to test a wide variety of ordering scenarios, AT&T did send orders to Ameritech with the expectation that the orders would be rejected. Of the 165 ordering scenarios embodied in its testing plan, AT&T sent only 14 forced error orders to Ameritech and the orders were rejected from the Ameritech system. Prior to sending these errors, Ameritech was informed of AT&T's plans.

AT&T also sent orders to Ameritech that duplicated previously-used order numbers. These orders were also rejected, but that was not AT&T's intent. Because the Ameritech-issued interface specifications said nothing about the requirement that order numbers have to be unique, the systems on AT&T's side of the interface were not set-up to avoid order number duplication. Other "Error Reason" statistics from the testing are reflected in the Order Processing Status Report, attached to this testimony. (See Exhibit TMC-03). Ameritech's

insinuation that AT&T created the errors for any reason other than testing purposes is an unfounded accusation.

SPECIFIC RESPONSES TO MICKENS' AND ROGERS' TESTIMONY

Q. IN THE PROPOSED SCHEDULE 5 ATTACHED TO HIS REBUTTAL TESTIMONY, MR. MICKENS PROVIDES A SET OF REPORTS THAT HE CONTENDS WILL SHOW THAT "OSS ACCESS IS EQUIVALENT" FOR CLECS. DO YOU AGREE?

A. No. The reports offered by Mr. Mickens would not reveal all relevant access equity/parity information. In fact, the absence of important details from the proposed reports may send false signals. For instance, Mr. Mickens' concept of measuring system/platform availability by using the OSS interfaces is misleading. Ameritech's internal systems -- not the interfaces -- perform the actual processing of CLEC transactions which affect competition. The interfaces are only the means to share and report on the processing of transactions. The system availability must reflect the end-to-end processing on the Ameritech "side of the interface" -- including the OSS availability.

The graduated scale of the proposed Platform Availability chart is also misleading. System availability is relevant at much finer points of measurement.

The operations support systems at issue here are operating 24 hours per day and seven days per week to handle Ameritech Illinois retail operations. In most industries that provide on-line services and system resources to others, systems availability that falls below 99.5% is unacceptable performance. The metrics offered by Mr. Mickens would therefore not sufficiently demonstrate critical performance needs.

Mr. Mickens believes that demonstrating transaction accuracy is relevant if the total on-line transaction time has a relationship with the total on-line transaction error time. The real issue is the frequency with which errors are detected -- not the amount of time spent in processing the errors. For each interface that receives transactions from CLECs and forwards those transactions to the ILEC systems, accuracy should be demonstrated by dividing the volume of transactions that are received by the number of transactions that are rejected.

The Business Function Completion Window is also inappropriate. It would be misleading to develop a relationship between transaction completion intervals and the amount of transaction time available in a month. The relevant test for parity is whether the interval for the CLEC is equal to the interval for Ameritech.

Finally, Mr. Mickens indicates that the first reports of the monthly measurements would be published after the first quarter is closed. This is grossly inadequate.

The information must be made available on a more timely basis. I would recommend that it be required to be distributed by the second week of the month following actual results.

Q. ARE THERE ADDITIONAL POINTS IN THE TESTIMONY OF MR. MICKENS THAT REQUIRE CLARIFICATION?

A. Yes. Several areas of Mr. Mickens' testimony reply to matters that were initially raised in my direct testimony. Mr. Mickens misses the point in his challenges:

- at Page 9, Mr. Mickens asserts that the USOCs in use by Ameritech Illinois are not defined by Ameritech, but by Bellcore, and that these are the only non-standard data within Ameritech's OSSs and interfaces. That is not the case. There are others, including the USOC non-standards, that require additional effort on the part of CLECs that attempt to interact with Ameritech's systems. To point out the most significant non-standard of all, as noted above, Ameritech is the only RBOC that has not stepped up to EDI Version 6.0. Mr. Mickens is silent on that score.
- Mr. Mickens says that there were several meetings between AT&T and Ameritech to discuss the interfaces. (Mickens at p 13). What Mr. Mickens fails to acknowledge is that the interface specifications that were discussed in the meetings were constantly changing. Moreover, as I mentioned previously, each new addition of the specifications was

published with no indication of where the changes were being made. AT&T was forced to review each generation of the specifications line by line to identify the changes. The point is that there were far too few meetings and those that occurred were largely unproductive because of the changing nature of the interface specifications.

- Mr. Mickens contends that the Ameritech interface specifications are not service or product specific (Mickens at p. 12) and that they will suffice for both total resale and unbundled network elements. He later contradicts himself by admitting that, as new products and services are introduced as the logical consequence of competition in the local service market place, "it may be necessary to enhance the OSS function interfaces or the underlying systems." (Mickens at p. 15). As discussed elsewhere in this testimony, I disagree with his conclusion that the same interfaces can be used regardless of the product.
- Mr. Mickens (at p 16) contends that the limitation of 75 product and service types has been eliminated, stating that my testimony on this issue was incorrect. In the current version of the ESO Guidelines (Version 3.0 issued on November 8, 1996), the Central Office Feature File for each switch serving a Central Office provides, starting in position 32, for only 75 USOC entries that can be ordered for any customer served by that central office switch. This limitation applies only to CLECs -- not to Ameritech Illinois in its retail markets.

- In addressing the OSS testing that Ameritech conducted (pp 18-20), Mr. Mickens' states that Ameritech supported AT&T's efforts to test the interfaces with Ameritech. What Mr. Mickens fails to address is the fundamental issue of end-to-end integration testing. The only testing of this nature that has been completed is the AT&T-Ameritech jointly conducted Service Readiness Test. As discussed above, the success rate of this testing, involving a total of only 211 orders, is only 38% over a period of 10 weeks.
- In his testimony on OSS Capacity (pp. 21-23), Mr. Mickens states that the capacities are sufficient and that they can be expanded within 90 days. Mr. Mickens fails to note that, when AT&T asked for copies of the studies Ameritech Illinois undertook for capacity planning, Ameritech objected to the request rather than explain its methodologies. *See* Response to Data Request ATT 100, attached as Exhibit TMC-05. Mr. Mickens is also silent on what consequences would befall CLECs in the case of an abrupt need for additional capacity that Ameritech could not address. It is likely that such transactions would be processed on an as-available basis, that the excess transactions would need to be re-provided on a load-balanced basis, or that Ameritech would simply reject the transactions until the capacity problem was solved. Even if additional capacity could be added on a 90-day basis, the immediate consequences could be disastrous.

Q. MR. ROGERS CLAIMS THAT AMERITECH'S OSS INTERFACES WILL OPERATE SUCCESSFULLY ON A COMMERCIAL BASIS. DO YOU AGREE?

A. No. It is far too early in the development process to make such an assessment. As shown in Exhibit TMC-02, Ameritech's interfaces have not yet been proven operationally ready with AT&T, nor has Ameritech shown evidence indicating readiness with any other company.

Q. AT&T SEEMS TO WANT A GUARANTEE OF TOTAL CERTAINTY THAT EVERYTHING WORKS PERFECTLY BEFORE IT AGREES THAT THE OSS INTERFACES ARE "OPERATIONALLY READY". WHY IS THIS NECESSARY?

A. AT&T is insisting on reasonable assurances -- not guarantees. AT&T needs to know that it will be fully supported in all five operational areas (from pre-ordering to billing), with systems that function timely, accurately and correctly under reasonable volumes, before it can commercially compete in the local market. I believe these expectations are consistent with the Telecom Act of 1996 and the FCC's order.

A brand new CLEC, well versed in telecommunications and with a defined and funded business plan, would necessarily hesitate to enter the Illinois market at this

time. There is no reasonable assurance that the CLEC's target market for resale of local service could be migrated successfully. Even if the target market were only basic residential or small business accounts, the expectation of success would be very low. The evidence of AT&T's experience alone would be enough to give any CLEC pause.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

BEFORE THE

PUBLIC SERVICE COMMISSION OF WISCONSIN

MATTERS RELATING TO SATISFACTION OF CONDITIONS FOR OFFERING INTERLATA SERVICE (WISCONSIN BELL, INC. d/b/a AMERITECH WISCONSIN)	)))))	6720-TI-120

PREFILED DIRECT TESTIMONY OF TIMOTHY M. CONNOLLY

OPERATIONS SUPPORT SYSTEMS

ON BEHALF OF
AT&T COMMUNICATIONS OF WISCONSIN, INC.

MARCH 19, 1997

the exhibit, we won't have to have it again, Mr. Dawson, you may take exception if you choose.

MR. DAWSON: No, I choose not to.

EXAMINER JAMES: So we will incorporate the direct testimony of Mr. Connolly. Is there any objection to his rebuttal testimony?

(No response.)

EXAMINER JAMES: Those will be incorporated into the record. And Ms. Marsh has moved the Exhibits 12 through 23 other than Mr. Dawson's objection to exhibits -- which numbers were those, Mr. Dawson?

MR. DAWSON: I think they translated into 20 and 21.

EXAMINER JAMES: All right. We have noted Mr. Dawson's objections to Exhibit 20 and 21, but hearing no other objections and having previously ruled on the substance of those, the exhibits will be received.

(Exhibits 12 through 23 received.)

(The prepared testimony of Timothy Connolly was incorporated into the record as follows:)

* * *

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Timothy M. Connolly. My business address is 50 Fremont Street, Suite 320, San Francisco, California, 94105.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am employed by the DMR Consulting Group, Inc. I am a management consultant specializing in information systems and technology projects involving the telecommunications industry.

Q. WHAT ARE YOUR QUALIFICATIONS RELEVANT TO YOUR TESTIMONY IN THIS PROCEEDING?

A. I have worked in the telecommunications industry for over twenty-five years and have spent nearly all of those years in developing, managing, planning and evaluating information systems and technologies for telecommunications carriers in the United States and around the world. I worked for AT&T for fourteen years (until 1991) in its headquarters organizations and in its domestic and international subsidiaries providing technical advice, management assistance and assessments regarding information systems and the use of information systems in customer operations. I worked for Illinois Bell Telephone Company prior to 1984 in its customer billing and services staff departments. I have a Bachelor degree in Finance from Creighton University in Omaha, Nebraska and a degree in Management from the University of Illinois at Chicago. I have done post-graduate work in economics at Rutgers University, Newark NJ and in operations planning at the Wharton School, University of Pennsylvania in Philadelphia.

Q. DESCRIBE YOUR PROFESSIONAL EXPERIENCES THAT SUPPORT YOUR TESTIMONY IN THIS PROCEEDING?

A. I have provided management and technical consulting services to exchange and interexchange telecommunications carriers in the United States, Canada, Europe and Asia in a variety of projects as an independent contractor and as an employee. I have worked in technical and administrative assignments in the areas of customer support systems, operations support systems, billing and customer service systems and other technology matters. I have provided consultant services to carriers endeavoring to enter new competitive markets and advised those clients in the technological characteristics of information systems that would support entry in those new markets, here in the US and abroad. Specific examples of the systems-oriented work I have done in the past five years was previously submitted with my sworn statement in this docket.

PURPOSE OF THIS TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of this testimony is to address issues surrounding the viability and usability of the interfaces to Ameritech's Operations Support Systems (OSS) -- the systems that competitors must rely on to order, provision, maintain and bill local service to customers in Ameritech's service territories in Wisconsin. Ameritech claims that these systems are currently operational and providing support to Competitive Local Exchange Carriers (CLECs) in Wisconsin.

My testimony will cover the following principal areas.

First, I will discuss Operations Support Systems and explain the steps necessary to insuring that these systems are operating and fully functional in a telecommunications environment.